Space Weather Forecast

Issued on Thursday, 25 May 2023 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further R1/R2 radio blackouts likely. Slight chance of Minor Geomagnetic Storms to start.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with two Moderate-class flares. There are currently six sunspot regions on the visible disc. A collection of sunspots in the north center disk remains the largest and most complex region on the disc. Another region in the southwest maintains a large spot. A recently developed region in the southeast continues to evolve, with multiple small but distinctive spots emerging. No Earth directed CMEs observed in available coronagraph imagery.

Solar Wind / Geomagnetic Activity: Solar winds have averaged between 500-600km/s through the period, on a generally steady trend. Total magnetic field strength was weak throughout, with the important north-south component varying weakly. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Moderate, with isolated to occasional Moderate flares likely and a slight chance of Strong flares. These most likely from the complex sunspot region in the northern center disk.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs expected, although a weak CME may give some glancing influence on Days 2 or 3 (26 or 27 May). Solar winds expected to remain at elevated levels around 500-600km/s during Day 1 (25 May) due to the continued influence of the high speed stream from the large coronal hole in the southwest quadrant. Wind speeds are forecast to decline steadily from Day 2 (26 May) onwards towards background levels due to the waning influence of the high speed winds, although any decline may be temporarily inhibited by the possible CME glance. Geomagnetic activity is forecast to be remain generally Unsettled with Active intervals possible during Days 1 and 2 (25/26 May), due to the continued high speed stream influence, and there remains a slight chance of G1/Minor Storms. Generally Quiet to Unsettled levels expected Days 3 and 4 as conditions likely trend towards background.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at background levels with no solar radiation storms occurring, but there is a slight chance of count rates increasing towards the minor storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	15	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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